PROMOTING INTEGRATIVE LEARNING THROUGH STUDENT ASSIGNMENTS

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Abstract

"Promoting Integrative Learning Through Student Assignments"

This poster reports on an investigation with students taking a design course in a final-year Bachelor of Engineering programme to test the hypothesis that "careful selection of the continuous assessment topic will lead to an integrative learning experience for the students, helping to unify the different strands of the module and developing the students' capabilities to apply their knowledge to new situations beyond the classroom environment".

The course investigated in this study, "Radio Frequency Integrated Circuit Design", incorporates a continuous assessment element which contributes 20% to the final module grade. In previous years the continuous assessment was based around the use of a Computer Aided Design tool used to perform detailed simulations of a circuit block that had been introduced in class. For the 2008/9 academic year, the continuous assessment was based around a technical research paper which incorporated some elements that had been previously discussed in class but also incorporated some elements not seen previously by the students. In this way, the students were challenged by a new application scenario for their knowledge while at the same time being encouraged to see how the different strands of the module could be combined to form a useful commercial product as outlined in the research paper.

This paper outlines how different elements of integrative learning such as an emphasis on real-world problems, an emphasis on the interconnections between the course topics, the incorporation of a student seminar (student as teacher) and the use of reports and feedback were incorporated into the continuous assessment component of the design module. It presents the results of a questionnaire designed to uncover the students' own opinions about their learning and provides an overall review of the investigation to identify the strategies that helped to promote integrative learning with a view to further developing these for future years.

Promoting Integrative Learning Though Student Assignments

Kevin McCarthy, Department of Electrical and Electronic Engineering, UCC

Introduction

This poster presents the results of an investigation into the use of continuous assessment to promote integrative learning. The investigation was based on the course "Radio Frequency Integrated Circuit Design" (EE4011), which is an optional final-year module in the B.E. (Electrical) programme at UCC and which incorporates a continuous assessment element that accounts for 20% of the final mark. The investigation formed part of an enquiry portfolio completed by the author to fulfill the requirements of a Post-Graduate Diploma in Teaching and Learning in Higher Education at UCC and involved suggesting a hypothesis and testing it by means of a suitable enquiry.

Hypothesis

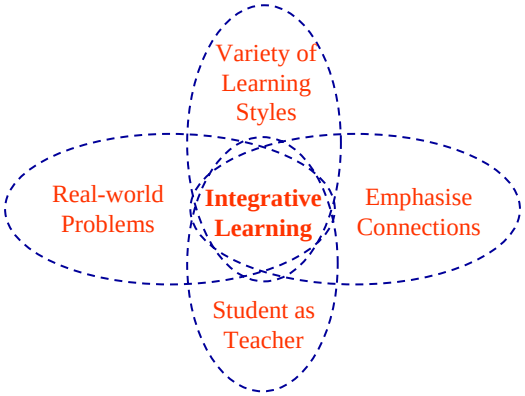
"Careful selection of the continuous assessment topic in EE4011 will lead to an integrative learning experience for the students, helping to unify the different strands of the module and developing the students' capabilities to apply their knowledge to new situations beyond the classroom environment."

Methodology

The continuous assessment asked the fourteen EE4011 students to:

- Read a recent research paper (Gramegna et al., 2006)
- Present a short seminar (not graded) based on the paper
- Prepare a detailed technical report based on the paper
- Answer several feedback questions

This design of the continuous assessment incorporated many elements associated with integrative learning (AACU, 2004) some of which are illustrated below:



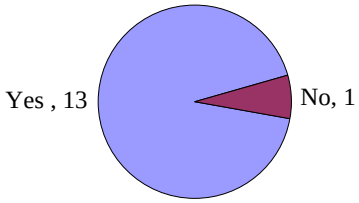
20% of the report grade was allocated to the feedback section which asked the students to comment on several aspects of the assignment including:

- If the assignment has helped to unify different aspects of the course and emphasise real-world applications
- If changes could be made to the organization of the assignment to improve student learning in the future

Results

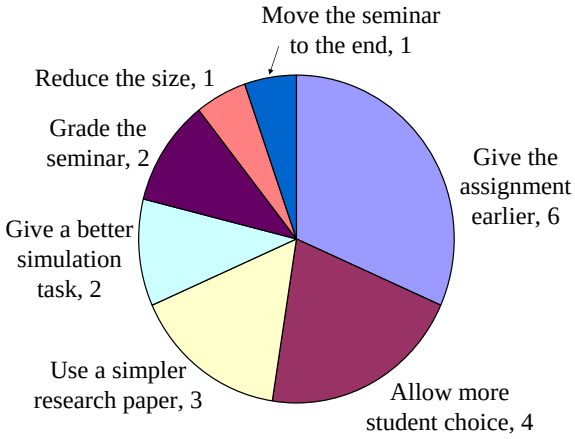
Do you feel that the research paper assignment helped you to see how different topics covered in EE4011 came together ?

Do you feel that an assignment based on a research paper was worthwhile to your learning?



Student Suggestions for Improvements

How could the continuous assessment be improved?



Conclusion

This small-scale enquiry has demonstrated that a well-chosen continuous assessment assignment can provide an integrative learning opportunity for engineering students, helping to clarify the link between their studies and "real-world" problems, thus confirming the initial hypothesis.

Future Work

It is planned to incorporate many of the student suggestions for improvement into the organization of the assignment for the current 2009/2010 academic year and to monitor the effects of these changes.

References

G. Gramegna et al. (2006) "A 56-mW 23-mm^2 Single-Chip 180-nm CMOS GPS Receiver With 27.2-mW 4.1-mm^2 Radio". IEEE Journal of Solid-Circuits, vol. 41, no. 3, pp540-551.

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